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The Yield of Sugar Cane in Barbados
in 1937

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The Yield of Sugar Cane in Barbados in 1937.

For the past eight seasons a number of plantations have co-operated with the Department in furnishing records of the number of tons of the different varieties of sugar cane which they have reaped.

This year 152 plantations have submitted returns and these were:—

LOW RAINFALL AREAS: 43 PLANTATIONS.*

| | |
|-------------------------|-----------------------|
| Appleby | Harrisons |
| Bromefield | Holders |
| Bushy Park (St. Philip) | Heywoods |
| Callendars | Hope |
| Canevale | Hopefield |
| Chance Hall | Husbands |
| Checker Hall | Mangrove |
| Cluffs | Oldbury |
| Congo Road | Pollards |
| Coverley | River |
| Durants | Rock Dundo |
| Ealing Grove | Ruby |
| East Point | Seawell |
| Enterprise | Spring Garden |
| Fairy Valley | Spring Hall |
| Flatfield | Trents |
| Friendly Hall | Union |
| Friendship | Union Hall and Briggs |
| Glen Villa | Wanstead |
| Golden Grove | Wiltshire |
| Grazettes | Wotton |
| Graeme Hall | |

* The returns from River, East Point and Golden Grove plantations are not included in the averages as certain areas are grown under irrigation.

INTERMEDIATE RAINFALL AREAS: 64 PLANTATIONS.

| | |
|---------------|--------------------|
| Alleynedale | Lascelles |
| Bagatelle | Lears |
| Bakers | Lodge |
| Bayfield | Lower Estate |
| Balls | Lowland |
| Belle | Molyneux |
| Bentley | Moonshine |
| Boarded Hall | Mount Pleasant |
| Bourbon | Mount Standfast |
| Brighton | Neils |
| Bulkeley | Norwood |
| Buttals | Palmers |
| Carmichael | Pickerings |
| Carrington | Pine |
| Castle | Prior Park |
| Chapel | Ridge |
| Clermont | Rowans |
| Clifden | Sandy Lane |
| Constant | Searles |
| Dayrells | Small Hope |
| Edgecumbe | Society |
| Farm | Stepney |
| Frere Pilgrim | Sunbury |
| Friendship | Trents (St. James) |
| Hampton | Valley |
| Hanson | Vineyard |
| Hannays | Warrens |
| Harrow | Waterford |
| Hopeland | Welches |
| Hill View | Westmoreland |
| Jordans | Woodbourne |
| Lamberts | Yorkshire |

HIGH RAINFALL AREAS: 45 PLANTATIONS.

| | |
|--------------|---------------------------|
| Ashbury | Guinea |
| Ashford | Haggatts & Bruce Vale |
| Auburn | Hopewell |
| Bawdens | Hope |
| Blackmans | Indian Pond |
| Bowmanston | Kendal |
| Canefield | Lancaster |
| Claybury | Lion Castle |
| Cliff | Locust Hall |
| Clifton Hall | Market Hill |
| Colleton | Mount |
| Content | Mount Wilton |
| Cottage | Plum Tree |
| Drax Hall | Pool |
| Dukes | Portland |
| Dunscombe | Strong Hope and Cleveland |
| Edgehill | Todds and Lemon Arbor |
| Ellesmere | Turners Hall |
| Endeavour | Vauchuse |
| Farmers | Wakefield |
| Fisherpond | Walkes Spring |
| Golden Ridge | Woodland |
| Groves | |

The total area reported gave an acreage of 19,145.44 acres made up as follows:—

| | | | | Acres. | Percentage of total. |
|-------------|----|----|----|------------------|-------------------------|
| Plant Canes | .. | .. | .. | 10,577.24 | 55.25 |
| 1st Ratoons | .. | .. | .. | 6,323.60 | 33.03 |
| 2nd | .. | .. | .. | 1,807.55 | 9.44 |
| 3rd | .. | .. | .. | 346.05 | 1.81 |
| 4th | .. | .. | .. | 91.00 | 0.47 |
| | | | | <u>19,145.44</u> | <u>100.00</u> |

Before the beginning of the reaping season, returns of the acreages under cane, both plants and ratoons, were obtained from all plantations in the island and a total of 32,266 acres was obtained. To this must be added 3,750 acres of peasant canes, making a grand total of 36,016 acres reaped in 1937.

The total crop for the season is approximately 127,264 tons of sugar or 3.53 tons of sugar per acre of cane grown.

The data recorded in the following variety tables do not include any variety from which reports of less than twenty acres have been received.

LOW RAINFALL AREAS.

43 PLANTATIONS.

| Plant Canes or Ratoons | Variety | Acreage | Total Tonnage | Tons per Acre |
|---------------------------|----------|----------|------------------|---------------------|
| Plant Canes .. | B.2935 | 2,078.80 | 71,979.65 | 34.63 |
| " " .. | B.726 | 219.50 | 6,609.40 | 30.11 |
| " " .. | Ba.11569 | 45.00 | 1,237.16 | 27.49 |
| 1st Ratoons .. | Ba.11569 | 38.25 | 836.06 | 21.86 |
| " " .. | B.2935 | 533.25 | 12,741.81 | 23.89 |
| " " .. | B.726 | 79.99 | 1,853.42 | 23.17 |

Records of the following varieties of a total of less than twenty acres were received from the low rainfall areas:—

| | | | | | | |
|-----------------|----|----|----|-------------|----|--------------|
| B.3013 | .. | .. | .. | Plant Canes | .. | 13.45 acres. |
| Mixed Varieties | .. | .. | .. | " " | .. | 4.00 " |
| B.417 | .. | .. | .. | " " | .. | 18.30 " |

These, however, have been included in the average yields given below.

AVERAGE YIELDS OF ALL VARIETIES—LOW RAINFALL AREAS.

| | | | | Total | | Average tons per acre |
|-------------|----|----|----|----------|-----------|-----------------------------|
| | | | | Acreage | Tonnage | |
| Plant Canes | .. | .. | .. | 2,379.05 | 80,799.17 | 33.96 |
| 1st Ratoons | .. | .. | .. | 651.49 | 15,431.29 | 23.69 |
| Total | .. | .. | .. | 3,030.54 | 96,230.46 | 31.75 |

It will be seen from the above Table that B.2935 is definitely superior to both B.726 and Ba.11569 as a plant cane. As a ratoon it is equal to B.726 and superior to Ba.11569.

INTERMEDIATE RAINFALL AREA.

64 PLANTATIONS.

| Plant Canes or Ratoons | Variety | Acreage | Total Tonnage | Tons per acre |
|---------------------------|-------------|----------|------------------|------------------|
| Plant Canes | B.2935 .. | 3,193.03 | 113,320.55 | 35.49 |
| " " | B.3013 .. | 56.23 | 1,686.99 | 30.00 |
| " " | Ba.11569 .. | 81.50 | 2,393.01 | 29.36 |
| " " | B.726 .. | 1,718.66 | 54,298.50 | 31.59 |
| " " | B.H. 10(12) | 176.71 | 5,631.56 | 31.87 |
| 1st Ratoons | B.2935 .. | 1,515.90 | 37,019.17 | 24.42 |
| " " | B.H. 10(12) | 130.50 | 3,460.02 | 26.51 |
| " " | Ba.11569 .. | 163.35 | 4,342.44 | 26.58 |
| " " | B.726 .. | 1,235.13 | 31,197.31 | 25.26 |
| 2nd Ratoons | B.2935 .. | 60.59 | 1,571.90 | 25.94 |
| " " | B.726 .. | 180.15 | 4,761.83 | 26.43 |
| " " | B.H. 10(12) | 35.00 | 954.69 | 27.28 |
| 3rd Ratoons | B.726 .. | 20.80 | 518.96 | 24.95 |

As plant canes B.2935 is seen to have appreciably outyielded all other varieties. B.3013 is slightly inferior to B.726 and B.H.10(12) in this area. It is not, however, comparatively at its best here and is being recommended for the high rainfall area. It is evident, quite apart from its gumming disease susceptibility, that Ba.11569 is inferior to the standard varieties here and should not be grown.

With regard to ratoons, B.2935 is only slightly inferior to B.H.10(12) and B.726 and it is probable that this lower mean yield may be accounted for by the occurrence of B.2935 in the poorer rainfall districts of this area.

Records of the following varieties of a total of less than twenty acres were received from the Intermediate Rainfall Areas:—

| | | | | | |
|-----------------|------|------|-------------|------|--------------|
| B.381 | .... | .... | Plant Canes | .... | 14.18 acres. |
| B.891 | .... | .... | " " | .... | 5.00 " |
| B.27(3) | .... | .... | " " | .... | 4.00 " |
| B.27(3) | .... | .... | 1st Ratoons | .... | 3.88 " |
| B.3234 | .... | .... | Plant Canes | .... | 15.75 " |
| B.663 | .... | .... | " " | .... | 6.00 " |
| B.663 | .... | .... | 1st Ratoons | .... | 6.00 " |
| B.381 | .... | .... | " " | .... | 12.50 " |
| B.891 | .... | .... | 2nd " | .... | 14.00 " |
| P.O.J. 2878 | .... | .... | " " | .... | 2.00 " |
| Mixed Varieties | .... | .... | Plant Canes | .... | 37.38 " |
| " " | .... | .... | 1st Ratoons | .... | 60.00 " |
| " " | .... | .... | 2nd " | .... | 6.00 " |
| Ba.11569 | .... | .... | 2nd " | .... | 19.00 " |
| B.891 | .... | .... | 1st Ratoons | .... | 15.25 " |
| B.417 | .... | .... | Plant Canes | .... | 5.00 " |
| B.755 | .... | .... | " " | .... | 4.00 " |
| B.3124 | .... | .... | " " | .... | .75 " |
| B.374 | .... | .... | 1st Ratoons | .... | 9.50 " |
| B.H.10(12) | .... | .... | 3rd " | .... | 11.50 " |

These, however, have been included in the average yields given below:—

AVERAGE YIELDS: INTERMEDIATE RAINFALL AREA.

| | Total. | | Average tons per acre. |
|------------------|----------|------------|------------------------------|
| | Acreage. | Tonnage. | |
| Plant Canes | 5,318.19 | 180,193.46 | 33.87 |
| 1st Ratoons ... | 3,152.01 | 78,745.93 | 24.98 |
| 2nd " ... | 316.74 | 8,392.47 | 26.50 |
| 3rd " | 32.30 | 863.02 | 26.72 |
| | 8,819.24 | 268,194.88 | 30.41 |

HIGH RAINFALL AREA.

45 PLANTATIONS.

| Plant Canes or Ratoons | Variety | Acreage | Total Tonnage | Tons per acre. |
|---------------------------|------------|----------|------------------|-------------------|
| Plant Canes .. | B.3013 | 49.75 | 1,901.81 | 38.23 |
| " " .. | B.2935 | 133.83 | 5,507.71 | 41.15 |
| " " .. | B.726 | 782.16 | 28,085.78 | 35.91 |
| " " .. | B.H.10(12) | 1,645.56 | 58,072.80 | 35.29 |
| 1st Ratoons .. | Ba.11569 | 66.00 | 1,599.14 | 24.23 |
| " " .. | B.726 | 827.31 | 28,290.00 | 34.19 |
| " " .. | B.2935 | 137.45 | 4,338.28 | 31.56 |
| " " .. | B.H.10(12) | 1,309.73 | 41,560.73 | 31.73 |
| 2nd Ratoons .. | B.726 | 489.90 | 15,360.66 | 31.35 |
| " " .. | B.H.10(12) | 917.61 | 26,913.80 | 29.33 |
| 3rd Ratoons .. | B.726 | 114.75 | 3,741.77 | 32.61 |
| " " .. | B.H.10(12) | 194.50 | 5,442.65 | 27.98 |
| 4th Ratoons .. | B.H.10(12) | 76.50 | 1,965.23 | 25.69 |

Two features in variety yields are notable in this area.

Firstly, it is satisfactory to note that the plant cane yield of the new seedling B.3013 is superior to that of the standards B.726 and B.H.10 (12). It is anticipated that its ratoon yields will show an even greater superiority over those of the standards.

Secondly, the ratoon yields of B.726 are definitely superior to those of B.H.10(12), and this in a year where little rotting was in evidence.

Records of the following varieties of a total of less than twenty acres were received from the High Rainfall Areas:—

| | | | | | | |
|-----------------|------|------|-------------|------|-------|--------|
| B.3013 | .... | .... | 1st Ratoons | .... | 3.50 | acres. |
| Ba.11569 | .... | .... | Plant Canes | .... | 4.00 | " |
| " | .... | .... | 3rd Ratoons | .... | 4.50 | " |
| B.381 | .... | .... | Plant Canes | .... | 7.50 | " |
| " | .... | .... | 1st Ratoons | .... | 8.00 | " |
| " | .... | .... | 2nd " | .... | 2.00 | " |
| B.6450 | .... | .... | Plant Canes | .... | 4.95 | " |
| " | .... | .... | 1st Ratoons | .... | 6.86 | " |
| B.3234 | .... | .... | Plant Canes | .... | 9.00 | " |
| B.891 | .... | .... | 2nd Ratoons | .... | 13.00 | " |
| B.417 | .... | .... | Plant Canes | .... | 5.75 | " |
| B.417 | .... | .... | 1st Ratoons | .... | 6.00 | " |
| B.2703 | .... | .... | " " | .... | 3.00 | " |
| B.2935 | .... | .... | 2nd " | .... | 15.30 | " |
| Mixed Varieties | .... | .... | Plant Canes | .... | 26.00 | " |
| " | " | .... | 1st Ratoons | .... | 13.25 | " |
| " | " | .... | 2nd " | .... | 30.00 | " |
| B.726 | .... | .... | 4th " | .... | 14.50 | " |

These, however, have been included in the average yields given below:—

AVERAGE YIELDS: HIGH RAINFALL AREAS.

| | Total | | Average tons per acre |
|----------------|----------|------------|--------------------------|
| | Acreage | Tonnage | |
| Plant Canes .. | 2,668.50 | 95,468.83 | 35.78 |
| 1st Ratoons .. | 2,381.10 | 76,873.16 | 32.28 |
| 2nd " .. | 1,467.81 | 43,989.31 | 29.97 |
| 3rd " .. | 313.75 | 9,311.14 | 29.68 |
| 4th " .. | 91.00 | 2,267.61 | 24.92 |
| Total .. | 6,922.16 | 227,910.05 | 32.92 |

The total average reported yields per reaped acre for the plantations submitting returns are as follows:—

| | Total | | Average tons per acre |
|----------------|-----------|------------|-----------------------|
| | Acreage | Tonnage | |
| Plant Canes .. | 10,577.24 | 364,020.86 | 34.41 |
| 1st Ratoons .. | 6,323.60 | 174,606.55 | 27.61 |
| 2nd „ .. | 1,807.55 | 53,000.46 | 29.32 |
| 3rd „ .. | 346.05 | 10,174.16 | 29.40 |
| 4th „ .. | 91.00 | 2,267.61 | 24.92 |
| Total .. | 19,145.44 | 604,069.61 | 31.55 |

YIELD OF SUGAR CANE PER ARABLE ACRE.

It is a matter of extreme interest to the planter to obtain the maximum yield for each acre planted with sugar cane on his estate but from the economic point of view the yield per arable acre of the whole plantation is the measure which determines whether sugar cane is being produced on an economic basis.

The higher rainfall areas may for practical purposes be described as the red soils and the lower and intermediate rainfall areas as the black soils, in which ratooning is less extensively practised than in the red areas. The following table shows the yield per arable acre in these two areas together with the arable acreage for all the plantations which have submitted crop returns and which may be taken as a very close reflex of the whole island.

| | Total. | | | Average tons per arable acre |
|------------------------------|-----------|---------------|----------------|------------------------------|
| | Reaped | Total arable. | Total tonnage. | |
| Black Soils | | | | |
| (a) Low Rainfall .. | 3,404.04 | 6,683.00 | 107,964.71 | 16.15 |
| (b) Intermediate Rainfall .. | 8,819.24 | 15,075.00 | 268,194.88 | 17.79 |
| Red Soils .. | 6,922.16 | 9,978.00 | 227,910.05 | 22.84 |
| Total .. | 19,145.44 | 31,736.00 | 604,069.64 | 19.03 |

Report of the Botanist

for the Year 1936-37.

BY

A. E. S. McINTOSH.

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A. SUGAR CANE BREEDING, SEEDLING SELECTION AND TRIALS.

(i) SUGAR CANE BREEDING—B. 39' SERIES.

Sugar Cane Breeding was carried out at Lion Castle during October, November and December, 1936.

In all, seventy-nine crosses were made. Details of the crosses made, and for each, the germinations, numbers potted and planted in the field nursery at Codrington are given in Appendix I. A summary is given below:

| Group. | No. Crosses. | No. Germina- tions. (Nov.-Dec. 1936). | No. Potted (Jan.-Feb. 1937). | No. planted in field Nursery (Mar.-Apr. 1937). |
|---|-----------------|---|---------------------------------------|---|
| Proven Cross (<i>Saccharum officinarum</i>) | 5 | 32,331 | 9,328 | 6,302 |
| Semi-Proven Cross (<i>Saccharum officinarum</i>) | 9 | 5,591 | 4,132 | 3,321 |
| Experimental Crosses Nobilisations. | | | | |
| (a) <i>Saccharum spontaneum</i> | | | | |
| (i) India | 3 | 999 | 460 | 386 |
| (ii) Celebes | 4 | 983 | 367 | 326 |
| (iii) Java | 31 | 31,190 | 2,620 | 2,135 |
| (b) <i>Saccharum barberi</i> | 6 | 1,151 | 635 | 520 |
| (c) <i>Saccharum sinense</i> | 4 | 89 | 81 | 60 |
| (d) Crosses involving several species of <i>Saccharum</i> | 17 | 10,596 | 1,713 | 1,423 |
| Totals | 79 | 82,930 | 19,336 | 14,473 |

On account of the poor performances of their populations in the first year seedling trial of the B. 39' series (see note in section (iii) below) the following crosses are eliminated from future breeding:—

Ba. 11569 x S. C. 12/4.
 „ x Burke.
 „ x D. 625.

The following will be promoted from the semi-proven to proven cross group:—

Ba.11569 x B.6450
 .. x B.6835

Points of interest arising out of the breeding work are noted. The wild variety Dacca gave a satisfactory number of seedlings while, once again, Co. 213 proved rather infertile.

For the first time, second nobilisations with Barbados varieties of the following were obtained:—*Saccharum spontaneum* (India), Java Kassoer and Synthetic Kassoer, Uba.

The nobilisation of chunnee (*S. barberi*) has been taken to the fourth degree, while that of Java glagah has reached the 6th degree. No further degree in nobilisation of the latter will be made. Breeding here will be confined to finding the best parents in the existing material of nobilised Java glagah in Barbados.

(II) PLANTING THE FIRST YEAR SEEDLING TRIAL—B.38' SERIES.

These seedlings were bred in 1935, and planted into a field nursery in April 1936. In October of the same year selections were made in the field nursery to plant the First Year Seedling Trial for season 1936-38.

The details of the nursery and First Year Seedling Trial plantings are presented in Appendix II. A summary is given here:—

| Group. | No. Crosses | No. in Field Nursery | No. planted in First Year Seed- ling Trial. |
|---|----------------|----------------------------|--|
| Proven Crosses (<i>Saccharum officinarum</i>) | 5 | 3,465 | 1,858 |
| Semi-Proven Crosses (<i>Saccharum officinarum</i>) | 12 | 4,605 | 2,651 |
| Experimental Crosses Nobilisations. | | | |
| (a) <i>S. spontaneum</i> | | | |
| (i) Celebes | 1 | 30 | 24 |
| (ii) Java | 29 | 3,912 | 2,445 |
| (b) <i>S. barberi</i> | 4 | 127 | 103 |
| (c) <i>S. sinense</i> | 2 | 80 | 25 |
| (d) mixed derivation | 12 | 2,428 | 1,203 |
| | 65 | 14,647 | 8,309 |

During the work of selecting in the nursery, notes were taken on the appearance of experimental crosses.

In the list of the individual crosses shown—Appendix II, the following are of special interest:—

Ba.11569 x Badila
B.3013 x B.H.10(12).

Of the former cross, 397 seedlings were planted, and of the latter 91. This is the first occasion on which seedlings of Badila have been obtained: the year 1935 being the only year so far in which it has arrowed. In view of the excellence of both varieties, B. 3013 and B.H.10(12), many of the seedlings derived from crossing them may reasonably be expected to be of a high standard.

(III) RESULTS OF REAPING THE FIRST YEAR SEEDLING TRIAL— B.37' SERIES.

These were bred in 1934, planted into a field nursery in 1935 and selected from the nursery and planted into the First Year Seedling Trial in October of that year. They were reaped during the crop of 1937. This series, therefore, represented the first to be tested under the new scheme, and, on that account, the results are of unusual interest.

The plantings were laid out as follows: The proven plus seed proven crosses were split into two lots, i.e. (1) early and (2) late. In each lot the cross populations were planted in blocks. The nobilised seedlings in the Experimental Cross Group were divided into seedlings of (a) higher and (b) lower degrees of nobilisation. Cross populations of the latter were planted in blocks: selections to provide further breeding material.

The individual seedlings of crosses in the former were placed at random in the Experimental Cross area—this to render legitimate a comparison of population performances.

In considering results these various categories are treated separately.

PROVEN AND SEMI-PROVEN CROSSES.

The usual methods of field and final selection were employed. The Table below indicates the field and final selections made and the comparative performances of the various crosses.

(1) EARLY GROUP.

| Cross. | No. Reaped. | No. Field Selected. | Per Cent. Field Selection. | Final Selection. | Per Cent. Final Selection. |
|---------------------------------|----------------|---------------------------|----------------------------------|---------------------|----------------------------------|
| Ba. 11569 x S.C. 12/4 | 679 | 38 | 5.6 | 11 | 1.6 |
| „ x B. 417 | 758 | 73 | 9.6 | 24 | 3.2 |
| „ x Ba. 8069 | 480 | 38 | 7.9 | 10 | 2.1 |
| „ x B. 6835 | 197 | 18 | 9.1 | 4 | 2.0 |
| „ x Q. 813 | 189 | 9 | 4.8 | 5 | 2.7 |
| „ x Burke | 158 | 9 | 5.7 | 2 | 1.3 |
| „ x D. 625 | 64 | 7 | 10.9 | 0 | 0.0 |
| „ x B. 6450 | 72 | 9 | 12.5 | 2 | 2.8 |
| Bourbon x B. H. 10 (12) | 79 | 8 | 10.1 | 2 | 2.5 |
| Totals and Means | 2,676 | 209 | 7.8 | 60 | 2.3 |

(2) LATE GROUP.

| Cross. | No. Reaped. | No. Field Selected. | Per Cent. Field Selection. | Final Selection. | Per Cent. Final Selection. |
|-----------------------------------|----------------|---------------------------|----------------------------------|---------------------|----------------------------------|
| Ba. 11569 x B. H. 10 (12) | 877 | 57 | 6.5 | 22 | 2.5 |
| Ba. 11569 x B. 603 | 921 | 75 | 8.1 | 25 | 2.7 |
| „ x Sealy Seedling | 80 | 4 | 5.0 | 2 | 2.5 |
| Ba. 11569 x D. 625 | 95 | 5 | 5.1 | 2 | 2.1 |
| Ba. 11569 x B. 6450 | 58 | 3 | 5.2 | 1 | 1.7 |
| Bourbon x B. H. 10 (12) ... | 91 | 2 | 2.1 | 1 | 1.1 |
| Totals and Means | 2,122 | 146 | 6.9 | 53 | 2.5 |

This was the first occasion on which first year seedlings were reaped after an average West Indies growing season. The effect of this growing season, longer than that previously used in this trial, was to show up shorter season crosses. Whereas, in the shorter season, these did very well, in the longer season their short growth periodicity was revealed by the presence of tapering canes, comparatively marked arrowing and low weights. A good example was seen in the cross Ba.11569 x S.C. 12/4—which was considered very good in the shorter season trial. It will now be eliminated. The best crosses were:—

| | | |
|----------|---|-------------|
| Ba.11569 | x | B.417 |
| „ | x | Ba.8069 |
| „ | x | B.6835 |
| „ | x | B.6450 |
| „ | x | B.II.10(12) |
| „ | x | B.603 |

The cross Ba. 11569 x Burke was poor, while Ba. 11569 x D.625 seedlings, although looking well in the field, gave extremely poor juice qualities. Both will be eliminated.

The crosses—Ba.11569 x Q.813, Ba.11569 x Sealy Seedling, and Bourbon x B. II.10(12), while giving, in the main only average seedlings, produced some very good individuals. They will be further tried.

EXPERIMENTAL CROSSES.

(1) *Higher Nobilisations*: These consisted of approximately 2,400 seedlings derived from 38 crosses. The crosses were chiefly 4th and 5th *glayah* nobilisations, a few *chunna* nobilisations, while some were of mixed derivation.

They were reaped about mid-crop and the usual field data obtained, including Zeiss Hand Refractometer readings for an adequate number of each cross.

Field and final selections were made; the latter, 79 in all, to be further tested in Barbados prior to selecting for test in other British West Indian Islands.

In order to compare the various crosses being tested, tables of field and final selections were prepared. In addition, an exhaustive analysis is being made of the performances in several important characters of cross populations. Future breeding policy, in nobilisation work, is guided by the data presented in these tables.

(2) *Lower Nobilisations* : These were nobilisations of lower degree : thus:—

| | | |
|-------------------|---|-------------------------|
| Uba | x | B.H.10(12) |
| „ | x | B.2935 |
| „ | x | P.O.J.2878 |
| Kassoer | x | B.II.10(12) |
| Synthetic Kassoer | x | „ |
| Toledo | x | „ |
| Ba.11569 | x | <i>Sacc. spontaneum</i> |

Populations of each cross were kept distinct in blocks. Selections were made with a view to providing material for further nobilisation work. In all, 29 were selected.

In general, it may be stated that the longer season employed in this trial showed up the marked arrowing tendency in the nobilised seedlings. In selecting, attention was paid to avoiding arrowing, or at least markedly arrowing seedlings. This should be of undoubted advantage in selecting seedlings for the British West Indies. Moreover, the analysis of the cross population data should be much more reliable in assessing the comparative values of crosses for conditions in the British West Indies.

(iv) MULTIPLICATION AND MINOR SELECTION PLOTS— B.35' SERIES (NOBLE VARIETIES)

These were selected from the First Year Seedling Trials in 1935. In all, 114 were selected. All were multiplied during 1935 at Codrington Experiment Station, and, in November of that year, sent to Dodds Station for further multiplication, gumming disease resistance tests and minor selection. The early group multiplication plots were reaped at Codrington during the crop of 1936, and this data used in making a selection for that group at Dodds in 1936, during a critical examination of all seedlings.

Of the 114 seedlings, 61 were eliminated on account of poor appearance in the field or susceptibility to gumming disease. This left 53 which were planted in Second Year Seedling Trials for season 1936—38.

(v) SECOND YEAR SEEDLING TRIALS. B.35' SERIES (NOBILISATIONS).

Since this is a new type of trial, a note of explanation is given here.

This type of trial is primarily intended to give a reasonably adequate second year's test in Barbados of selected *nobilised* first year seedlings prior to making final selections for test in various British West Indian Islands. Such nobilised seedlings, in the First Year Trial, constitute the majority of the so-called Experimental Cross Group. The term nobilised here implies that they are derived from wild parents crossed several times to Barbados noble varieties. The object of this process of nobilisation in Barbados is chiefly to provide seedlings for (1) areas in the British West Indies which have good growing conditions but are dominated by mosaic disease—hence mosaic disease resistance is desirable; and (2), areas in the British West Indies which have intrinsically poor soil conditions. These conditions are not present in Barbados. This trial would, therefore, not have been reported in detail here, were it not for the fact that it contained, in the former category, seedlings which showed, quite apart from possible mosaic resistance, promise of competing directly with standard varieties in Barbados.

The trial reported here concerns nobilised seedlings selected from the Experimental Cross Group in 1935. These were multiplied during the growing season of 1935, and, prior to planting at Codrington in November of that year, a minor elimination was made. The seedlings remaining for test were divided into two lots, i.e., (1) thick canes for better soil conditions, with possible commercial resistance to mosaic; and (2), thin canes for poor soil areas. These were planted in adjoining trials: in the former B.2935, and in the latter Co.213

being used as standards. There were four randomised blocks in each trial and the plot size was approximately 1/150 acre.

At reaping, data was obtained on plot cane yield, number of rotten canes and sucrose per cent. in juice from an 80 lb. cane sample.

For cane yield, the per cent. standard deviation of the trial was 9.26, and for sucrose 3.47 in the thick-cane trial, while, in the thin-cane trial, corresponding figures were 12.8 and 3.44. In view of the very small plot size, these figures may be regarded as highly satisfactory.

Selections were as follows:—

- (1) thick-cane trial—B.35151, B.35176, B.35179, B.35187, B.35221
B.35237, B.35245.
- (2) thin-cane trial—B.35197, B.35200, B.35204, B.35207, B.35214,
B.35247.

All selections were immediately despatched to the Plant Quarantine Station in Trinidad.

Two of the selections were considered sufficiently promising to multiply and put into Select Seedling Trials and Maturity Experiments in Barbados, i.e., B.35187 and B.35245. These will be tested in the same series of trials as the B.34' noble cane selections noted in the following section.

(vi) SECOND YEAR SEEDLING TRIALS.—
B.34' SERIES (NOBLE VARIETIES).

These were reaped at Dodds and Todds during the 1937 crop. At both stations there were an early and a late group, reaped respectively early and late in crop for each station.

The usual data was taken at reaping and seven seedlings were finally selected for more extensive tests in Barbados. These are:—B.3419, B.3429, B.3439, B.3461, B.3464, B.3479, B.3482. With the exception of B.3439, all will be tested during season 1937-39 in Select Seedling Trials and Maturity Experiments. The seedling B.3439 is sufficiently promising to be tested in Variety Trials during the same season, as an early variety in the lower rainfall black coral limestone soils.

(vii) NOTE ON SEEDLINGS OF THE B.33' SERIES
(NOBLE VARIETIES).

These were selected from Second Year Seedling Trials during the 1936 crop and are:—B.3307, B.3327. These are at present (season 1936-38) undergoing tests in Select Seedling Trials and Maturity Experiments.

(viii) SELECT SEEDLING AND VARIETY TRIALS.—
B.30', B.31', and B.32' SERIES.*

(a) *The Seedlings Tested.*

(1) *Select Seedling Trials:*

| | | |
|---|-------------|-------------|
| | Plant Canes | B.3013 |
| | | B.3216 |
| | | B.3267 |
| | | B.3234 |
| | | B.3259 |
| " | " | 1st Ratoons |
| | | B.3124 |
| | | B.3127 |
| | | B.3216 |
| | | B.3234 |
| " | " | 2nd Ratoons |
| | | B.3013 |
| | | B.3127 |

(2) *Variety Trials:*

| | | |
|---|-------------|-------------|
| | Plant Canes | B.3124 |
| | | B.3013 |
| | | B.3234 |
| " | " | 1st Ratoons |
| | | B.3013 |
| | | B.3234 |

(b) *An Ecological Classification of the Trials.*

This classification is similar to that used in last season's Report. The areas are:—

- A. Black and sandy coral limestone soils where average seasonal rainfall is low. On account of low rainfall ratooning is difficult and tonnages are, as a rule, low.

Stations in this category were:—

- (a) Select Seedling Trials. Plant Canes. Sunbury, River.
(b) Variety Trials. Plant Canes. Spring Garden, Coverley, Sandford, Six Men's, Gibbons.
(c) Variety Trials: First Ratoons. Pollards.

- B. Black coral limestone soil area of low-intermediate rainfall. On account of a better rainfall, a certain amount of ratooning is practised in this area. The extent of ratooning would increase were strong ratooning seedlings available.

Stations in this category were:—

- (a) Select Seedling Trials: Plant Canes. Yorkshire.
(b) Select Seedling Trials: First Ratoons. Lower Greys.
C. Valley deep black coral limestone soil area, low-intermediate rainfall. This area may experience a certain amount of waterlogging. A considerable percentage of this area is ratooned.

* The object and nature of these types of trial are noted in the introduction to the corresponding section of last season's Report.

Stations in this category were:—

- (a) Select Seedling Trials. Plant Canes. Bentley.
- (b) Variety Trials: Plant Canes. Bulkeley.
- D. Red coral limestone soil area, intermediate to high rainfall. One to three ratoon crops are grown here.

Stations in this category were:—

- (a) Select Seedlings Trials. Plant Canes:
 - Lears
 - Bowmanston
 - Fairview
- (b) Select Seedling Trials. First Ratoons
 - Lammings
 - Apes Hill
 - Fisher Pond
 - Hothersal
- (c) Select Seedling Trials. Second Ratoons.
 - Cottage
 - Guinea
 - Wakefield
- (d) Variety Trials. Plant Canes.
 - Blowers
 - Cliff
 - Society
 - Claybury
- (e) Variety Trials. First Ratoons
 - Vaocluse
 - Ashbury
 - Kendal
 - Lancaster
 - Clifton Hall
 - Farmers
 - Mount Wilton

(c) *Rainfall during the Season.*

The average rainfall for a number of stations over the Island for 1936 was 60.22 inches. This practically equals the average annual rainfall for the forty-year period, 1890-1929:—60.87 inches.

The monthly distribution of the 1936 rainfall was as follows:—

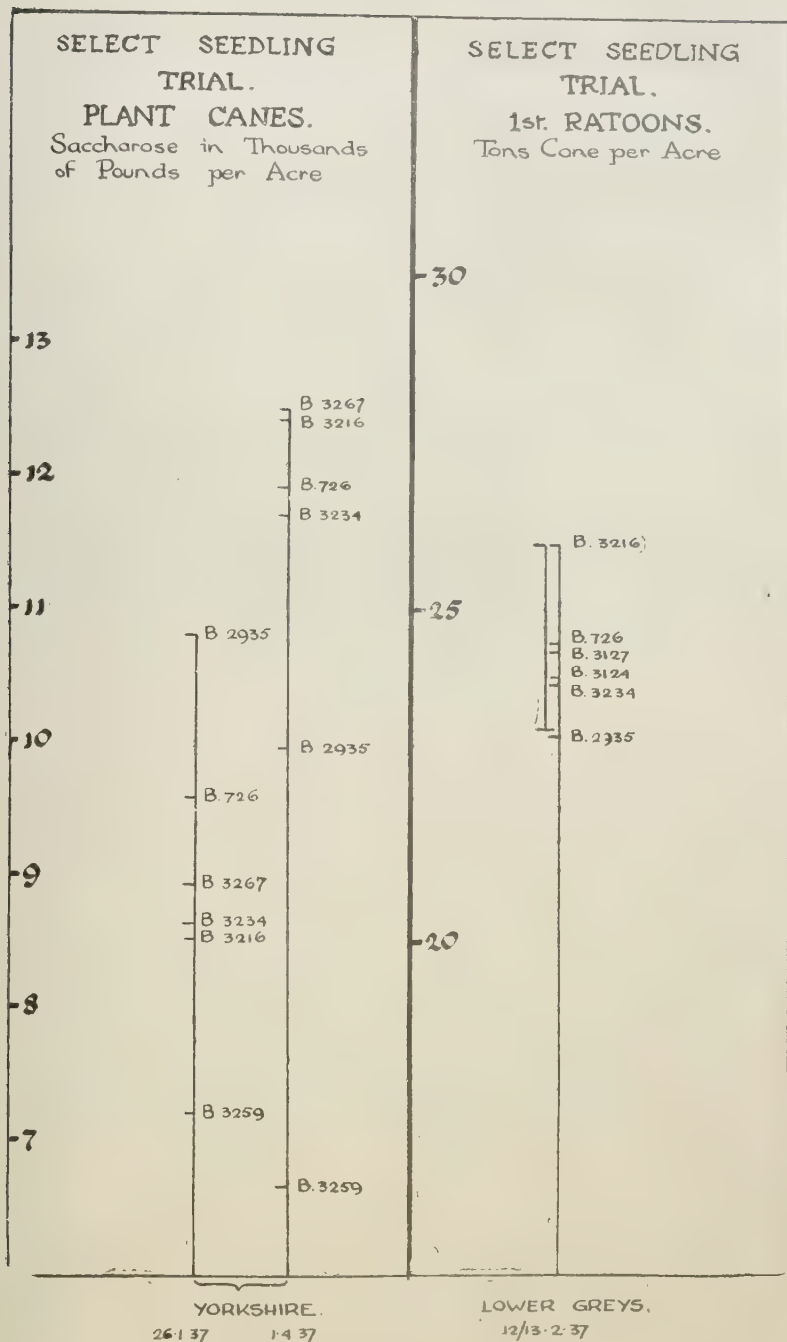
January 1.74, February 1.18, March .12, April 1.78, May 3.67, June 9.45, July 12.00, August 6.25, September 5.63, October 7.57, November 6.64, December 4.19.

The dry season, January to May, was very severe and stools, especially ratoon stools, were backward. The rains of June, July and August were excellent, and this, following on the drought, encouraged high tillering. The rains from September to December were below average and somewhat retarded growth.

January, 1937, brought exceptionally high rains which caused renewed late growth, particularly in ratoons. During the crop months, February to May, rains were very low.

16/17.2.57

FIG II. CATEGORY B.



As a result of the rainfall distribution, canes were very vigorous during crop, and little rotting or drying out was seen. Juices, however, were low at the beginning of crop, but improved, at first slowly, later more rapidly, until excellent juices were reached from mid to late crop.

The tonnages of the 1937 crop were approximately similar to those for the 1936 crop and the slightly lower sugar production of the former year was probably due to the low juice qualities early in crop in 1937.

(d) *Results of the Trials.*

In select seedling plant cane trials, the following routine data is obtained:—(1) cane tonnage, (2), number of rotten canes, (3) complete cane chemical analyses from plot sample bundles, and so (4) calculation of the saccharose per acre. Statistical analyses of cane tonnages and sucrose per cent in juice are made. In Select Seedling ratoon trials, cane tonnages and number of rotten canes only are obtained. Thus, for seedlings, comparative cane chemical data are obtained in Select Seedling plant cane trials only, and the figures obtained serve for approximating the saccharose yield of seedlings in Select Seedling ratoon and Variety Trials.

The results are presented in a series of figures. The Figures present, for plant cane Select Seedling Trials, the important figure—yield of saccharose per acre, and for ratoon Select Seedling Trials and Variety Trials the tonnage of cane per acre. The small lines, alongside ratoon Select Seedling and Variety Trials, represent established significant differences in tonnages between seedlings.

The various categories are considered in turn:—

Category A. (Figure 1).

Two plant cane Select Seedling Trials, five plant cane Variety Trials and one first ratoon Variety Trial were reaped in this category.

None of the seedlings tested in the plant cane Select Seedling Trials showed promise of even equalling the standard B.2935. They will be discarded for this category.

The plant cane Variety Trials were designed to test B. 3124 as an early variety. It was decidedly inferior in tonnage to B. 2935, and was little, if at all, better than the early variety B. 726. The latter is to be preferred to B. 3124, it being a sounder variety. B. 3124 will be no further tested.

The conclusion for this category is that B. 2935 is easily the best variety. Its limitations are its low juice quality early in crop, and its irregular ratoon springing under difficult conditions. An early ripening and stronger ratooning seedling is desirable here. Two seedlings are being tested for this purpose:—B. 3307 and B. 3439.

Category B. (Figure 2).

One plant cane and one ratoon Select Seedling Trial were reaped here.

The seedlings B. 3234 and B. 3259 are definitely inferior to the standard varieties:—B. 2935 and B. 726. B. 3216 yielded well in the late reaping of the plant cane and in the ratoon trial. This seedling, however, is very susceptible

to the Red Rot fungus and it is therefore dangerous to consider it any further. B. 3267 was reaped in the plant cane trial. It was indifferent in the early reaping and first in the late reaping. It gave a heavy yield of cane of low juice quality. Actually, in saccharose yields, it was no better than B. 726 over the two reapings. Moreover, it shows a tendency to rot as crop progresses. It is not promising as a standard cane.

In the ratoon trial B. 3127 was the best of the seedlings, yielding close to B. 726. It will be further tested in this category. B. 3124 was not so good as B. 726 and it will be discarded.

As expected, B. 726 compared favourably with B. 2935. It must not be forgotten, however, that, in a season of lower rainfall than the one considered here, B. 2935 would undoubtedly outyield B. 726 appreciably. It is therefore, safer to have the greater part of the acreage in B. 2935.

Category C. (Figure 3).

It is unfortunate that the Select Seedling Trial at Carrington and the Variety Trial at Constant were not ratooned, more particularly since B. 3127 was in the former and B. 3013 in the latter.

One plant cane Select Seedling and a Variety Trial were reaped. The standard here is B. 726. The seedlings B. 3013, B. 3216, B. 3234, B. 3259, and B. 3267 were all inferior to the standard. In the Variety Trial, the canes of B. 2935 were rotting markedly. It is this feature which makes this variety a very doubtful proposition in valley soils. It should not be planted here.

The seedling B. 3127, during tests of previous seasons gave excellent yields in valley soils, and it is being tested here in two Variety and one Select Seedling Trial, during the present season 1936-1938.

Category D. (Figure 4 and 5).

The standard varieties here are B. 726 (early) and B.H. 10(12) (late). A large number of trials—21 in all—were carried out. This was due to (1) more ratooning in this area and (2) a large scale series of tests of the seedlings B. 3013 and B. 3234.

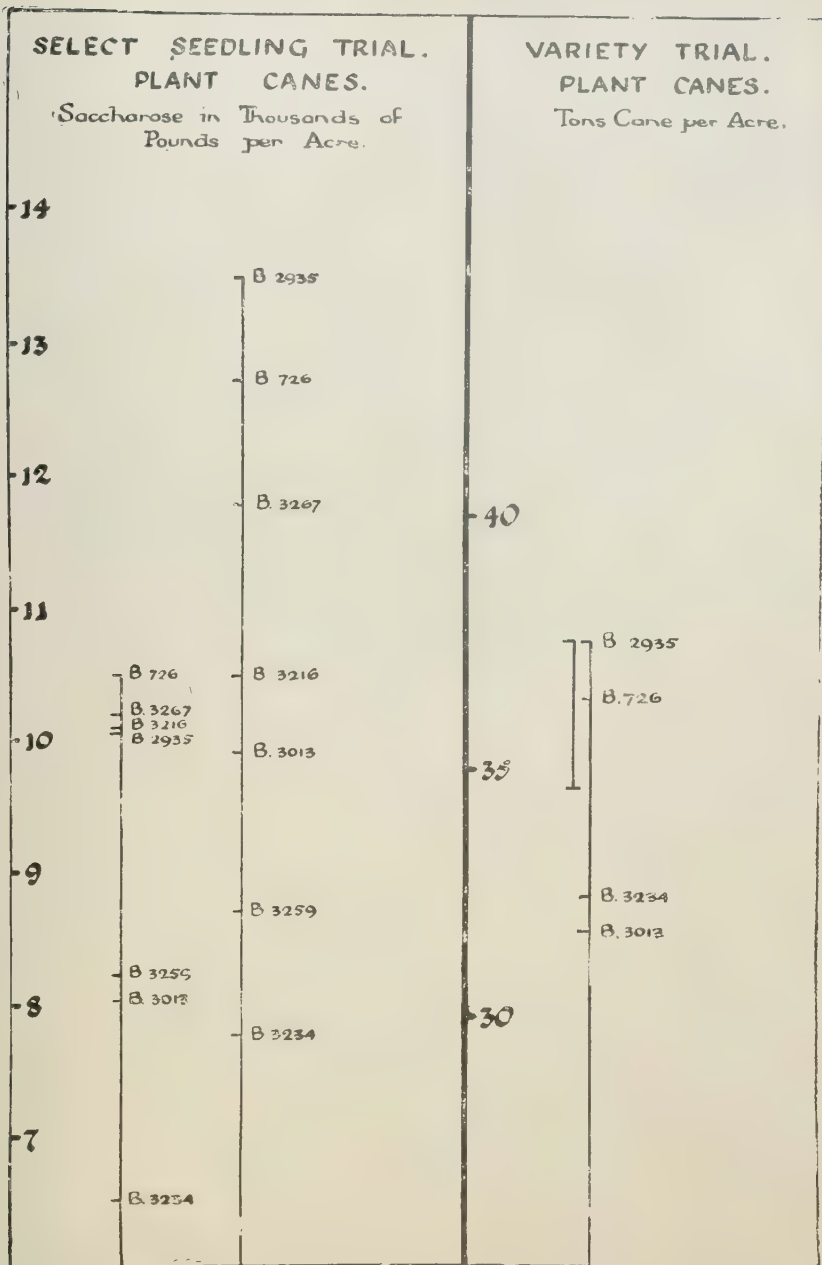
The seedlings tested were:—B. 3013, B. 3127, B. 3216, B. 3234, B. 3259 and 3267.

The following do not show promise of becoming standard varieties—B. 3216, B. 3234, B. 3259, and B. 3267. These are considered here.

B. 3216. This seedling grows strongly and, as a rule, gives good yields of cane and saccharose. It is, however, liable to rot very quickly during crop (c.f. Lears, Lammings and especially Fisher Pond). This feature is obviously highly undesirable in a commercial variety. For this reason, it will be discarded.

B. 3234. This seedling gives very high plant cane and especially ratoon tonnages. In these respects it is very close to B. 3013. The latter, however, is to be preferred on account of a very superior juice quality. The promise of B. 3234 has therefore been masked by the greater promise of B. 3013. B. 3234

FIG III. CATEGORY C.



GENTLEY.
27-1-37 5 4 37

BULKELEY.
27/27 2 37

FIG IV. CATEGORY D.

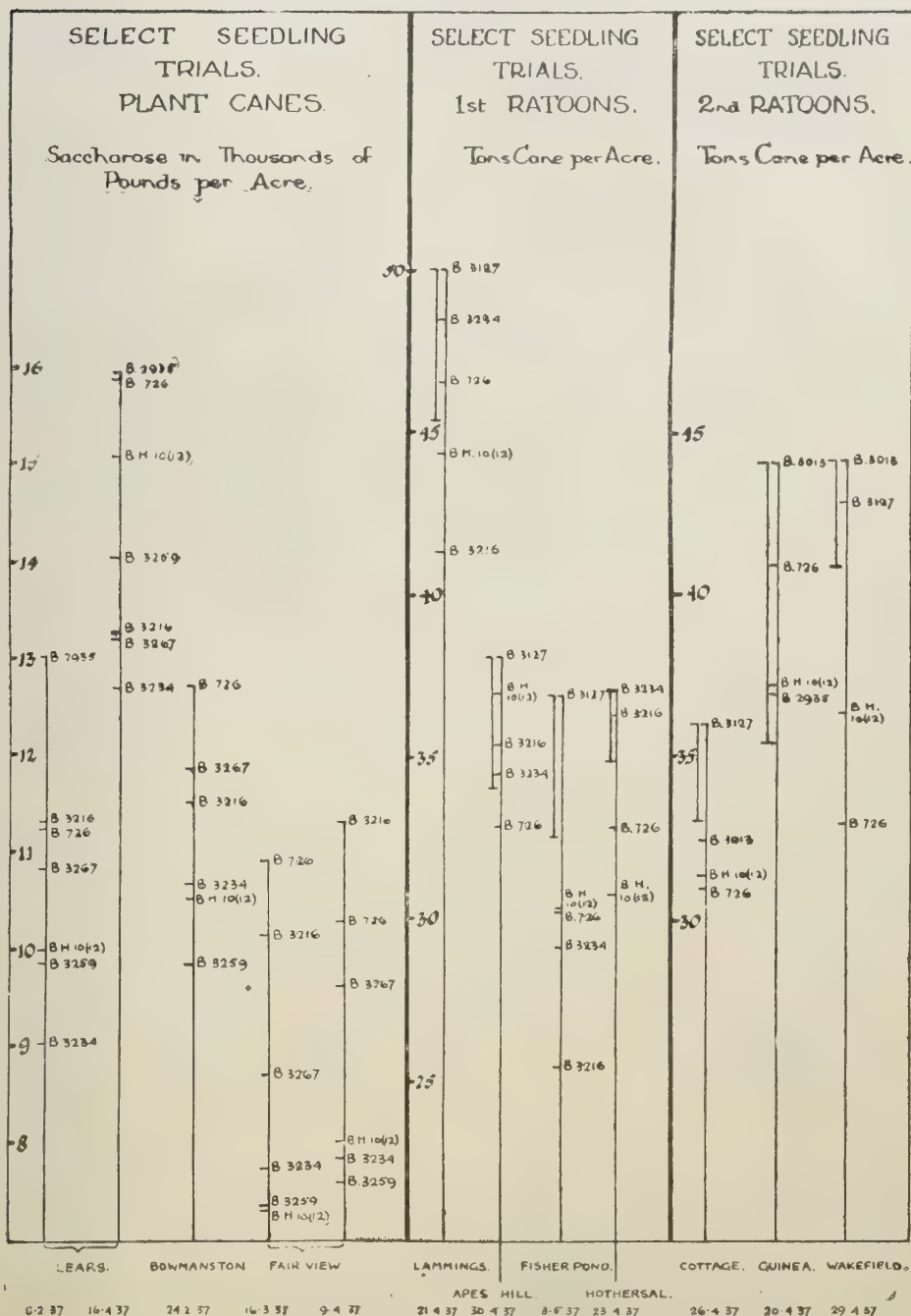
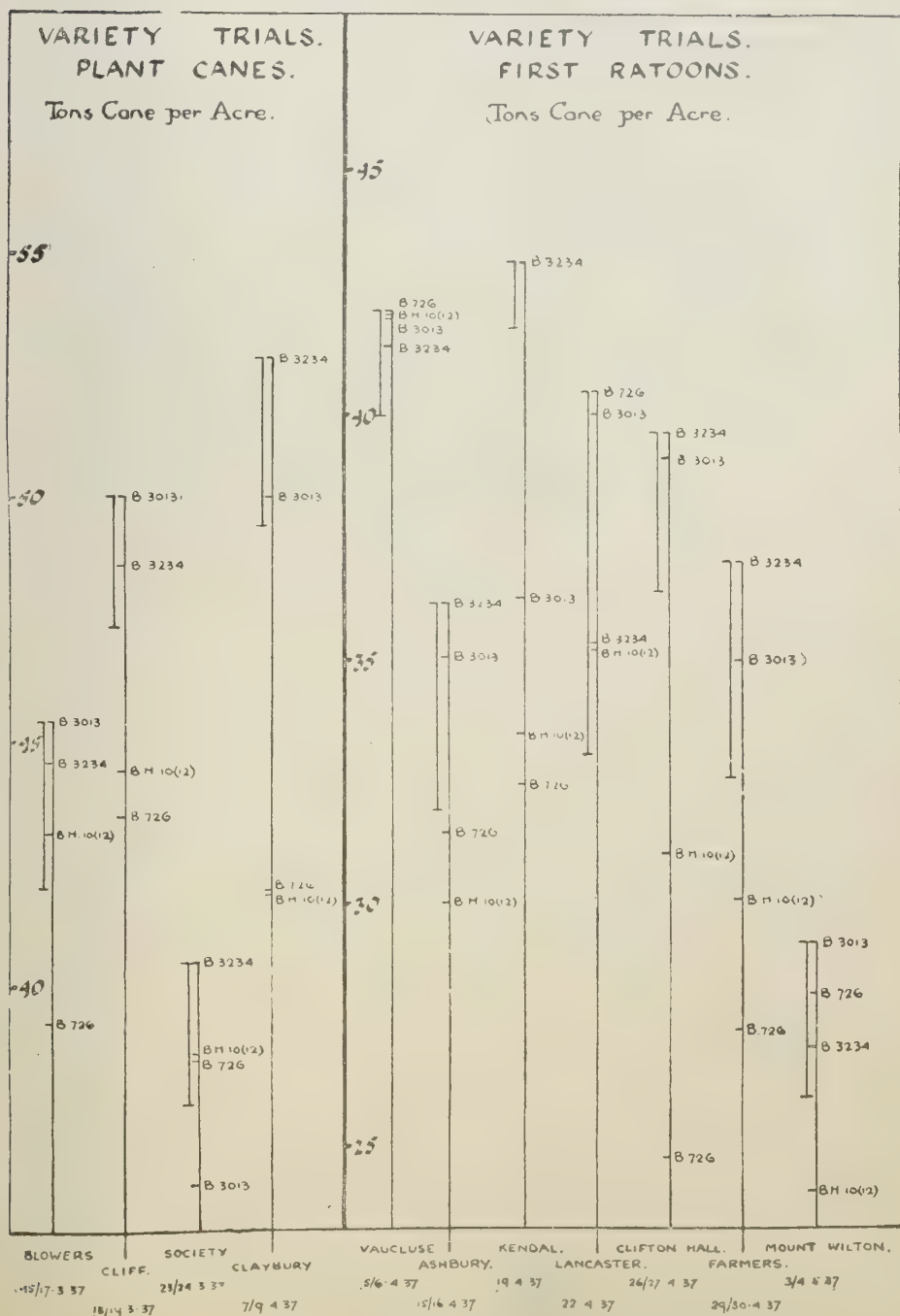


FIG V. CATEGORY D (concl).



will not be recommended for commercial plantings, but will be retained by the Department of Agriculture.

B. 3259. This seedling ripens very early and has very high juice quality. It is however liable to rotting and gives very low cane tonnages. It is definitely inferior to the standards and will be discarded.

B. 3267. In red soils this seedling gives cane yields approximately equal to the standard varieties, but a very inferior juice quality. It will be discarded.

The elimination of the above seedlings leaves two for further detailed consideration, i.e. B. 3013 and B. 3127.

These are considered here :—

B. 3013. In red soil trials during the season under review, this seedling was reaped in three Second Ratoon Select Seedling Trials, four plant cane and seven first ratoon Variety Trials. The standards were:—B. 726 and B.H. 10(12). B. 3013 outyielded the standards at three out of four plant cane Variety Trials, five out of seven first ratoon Variety Trials, and in all second ratoon Select Seedling Trials.

This seedling's performances in red soils, since it reached Select Seedling Trial stage, are summarised below.

B.3013 v. B.726 AND B.H.10(12)—RED SOILS 1934/37.

(a) *Tons Cane per Acre.*

(i) *Plant Canes.*

| Year. | No. of Trials. | Variety and Average Yield Cane per Acre. | | |
|--------------------|----------------|--|--------|------------|
| | | B.3013 | B.726. | B.H.10(12) |
| 1934 | 3 | 37.43 | 36.89 | 36.57 |
| 1935 | 5 | 33.77 | 36.20 | 35.14 |
| 1936 | 9 | 40.00 | 36.86 | 38.78 |
| 1937 | 5 | 47.08 | 39.92 | 42.61 |
| Average 1934/37 .. | 22 | 39.80 | 37.00 | 38.52 |

(ii) First Ratoons.

| | | | | | | |
|--------------------|----|----|----|-------|-------|-------|
| 1935 | .. | .. | 1 | 34.20 | 34.00 | 28.90 |
| 1936 | .. | .. | 3 | 36.12 | 30.33 | 31.60 |
| 1937 | .. | .. | 7 | 38.86 | 34.69 | 34.50 |
| Average 1935/37 .. | | | 11 | 37.69 | 33.44 | 33.20 |

(iii) Second Ratoons.

| Year | | | No. of Trials. | B.3013 | B.726 | B.H.10(12) |
|------|----|----|----------------|--------|-------|------------|
| 1937 | .. | .. | 3 | 40.54 | 35.32 | 35.06 |

(b) *Per Cent. Sucrose in Cane.*

| Year | | | No. of Trials. | B.3013 | B.726 | B.H.10(12) |
|---------|----|----|----------------|--------|-------|------------|
| 1934-35 | .. | .. | 7 | 15.19 | 15.41 | 14.08 |

Observations.

With regard to **tonnage of cane** as a **plant cane**, B. 3013 outyielded the standards in three out of four years, especially in 1936 and 1937. The season affecting the 1936 crop was one of higher than average rainfall, that affecting the crops of 1934 and 1937 being average rainfall. The rainfall affecting the 1935 crop was well below average. The conclusion is that B. 3013 in low rainfall years will yield slightly less than the standards, while in average and especially above average rainfall years, it will decidedly outyield the standards.

It is as a **ratoon**, however, that B. 3013 is markedly superior to the standards, and this even in seasons of below average rainfall (c.f. 1935 yields of first ratoons). It is probable that, in addition to increasing average ratoon yields, B. 3013 will ratoon economically for more seasons than the standards. In this respect, it was noticeable throughout the trials that B. 3013 retains its fresh appearance throughout crop and springs very readily and strongly after being cut.

With regard to **per cent. sucrose in cane**, B. 3013 is seen to be close to B. 726, and definitely superior to B.H. 10(12). Maturity experiments have shown it to ripen very soon after B. 726. It is an unusually sound seedling, little cane rot being experienced, and is comparatively little attacked by rats.

B. 3013. has undoubtedly shown, by its performance in the trials noted here, that it is superior to the standards in **red soils**. In the coming planting

season it will be recommended in these areas for an approximate 50 per cent. planting.

B. 3127. This seedling is one year younger than B. 3013. Consequently less data is available and any conclusions made here are only tentative.

During the season under review, it was reaped in one first ratoon Select Seedling trial in Category B, in three first and two second ratoon Select Seedling trials in Category D.

In the ratoon trial in the low-intermediate rainfall black coral limestone soil area (Category B) it yielded equal to B. 726, in the first and second ratoon trials in red soils (Category D) it outyielded the standards—B. 726 and B.H. 10(12)—in all trials: in the second ratoon trials by large margins.

Its strong ratooning powers, noted in last season's Report, are therefore again evident this crop.

This seedling has first class juice qualities and an average to above average fibre content.

It is hoped that it will have a wider adaptation than B. 3013: especially does it give promise for valley soils (Category C) and low-intermediate rainfall black soils (Category B.)

(e) *Note on Select Seedling and Variety Trials Being Conducted During The Present Season 1936-38.*

Eight Select Seedling Trials were planted in 1936. B. 3013 has now been incorporated as a standard variety in red soil trials, and is being further tested in valley soils, and low-intermediate rainfall black soils. B. 3127 is being tested in all stations, i.e. over all ecological conditions. New seedlings to the trials are B. 3307 (in lower rainfall districts), B. 3327 (in low-intermediate to high rainfall districts) and B. 3439.

Twelve Variety Trials were planted. These are designed to test B. 3127 against standard varieties, thus:—

- | | | |
|--|---------|-----------|
| (1) Low and low-intermediate rainfall black soils (Categories A & B) standards—B. 2935, B. 726 | .. .. . | 5 trials. |
| (2) Valley Soils (Category C) standard—B. 726 | .. .. . | 2 trials. |
| (3) Red Soils (Category D) standards—B. 726, B.H. 10(12) | .. .. . | 5 trials. |

(f) *Note on the Seedling Requirements of Barbados.*

As noted in last season's Report, so this season the chief requirement is an early ripening seedling for the low rainfall black soils (Category A). B. 3124 has been tested here for this purpose, but is considered not up to commercial standard.

Two seedlings are being tested for this purpose, i.e. B. 3307 and B. 3439. The former is as noted above in Select Seedling Trials for season 1936-38, the latter is being multiplied for Variety Trial tests against B. 2935 during season 1937-39.

(g) Planting Recommendations.

These will be issued as usual to each estate and small holders' area prior to the coming planting season. Four varieties will be recommended—B. 726, B.H. 10(12), B. 2935, B. 3013. The proportion of B. 3013 recommended will be greatly increased for red soil areas.

B. SHORT NOTE ON SPECIAL INVESTIGATIONS IN SUGAR CANE.

Special investigations are described in detail from time to time in separate publications. An outline report on these undertaken during the season under review has recently been published (*Agric. Journ.*, Dept. Sci. & Agric., Vol VI, No. 2, April, 1937).

They are listed here:—

- (1) Maturity Experiments.
- (2) Growth Measurements.
- (3) Root System Investigations.
- (4) Gummy Disease Investigations.
- (5) Fuzz Storage Experiments.
- (6) Experiments with the Zeiss Hand Refractometer.
- (7) Studies on Cane Rot and Ratooning.

Those listed under (1), (2) and (4) are routine investigations carried out on seedlings during their trial and selection. An account of the Gummy Disease Investigations is to be published in the near future.

The Root System Investigations and the Fuzz Storage Experiments have been concluded. The results of both have been published. (1, 2).

Further experiments on the Zeiss Hand Refractometer were made during the 1937 crop, and the results will be published some time during the year.

A new line of investigation into the phenomena of cane rotting and ratoon springing has been started.

1. G. C. Stevenson (1936) Investigations Into the Root Development of the Sugar Cane in Barbados. (ii) Further Observations on Root Development in Several Varieties under one Environment. B.W.I. Cent. S.C. Breeding Stn., Bull. No. 11.

2. A. E. S. McIntosh

&

G. C. Stevenson (1937) Sugar Cane Fuzz Storage Experiments. Ibid No. 12

APPENDIX I.

Sugar Cane Breeding, Seedling Raising and Field Nursery Planting.
1936-37.

*Details of Crosses made, their Germinations, Numbers Potted and
Numbers Planted in Field Nursery.*

| Cross. | Group. | No. Germinations. (Nov.-Dec. 1936). | No. Potted (Jan.-Feb. 1937) | No. Planted in Field Nursery. (Mar.-Apr. 1937) |
|-----------------------|--|--|--------------------------------|---|
| Ba.11569 x B.H.10(12) | Proven Cross <i>Saccharum officinarum</i> . | 14,832 | 3,320 | 2,718 |
| „ x S.C. 12/4 | „ | 8,223 | 1,570 | 0 |
| „ x B.603 | „ | 2,689 | 2,160 | 1,733 |
| „ x Ba.8069 | „ | 4,330 | 1,000 | 862 |
| „ x B.417 | „ | 2,238 | 1,278 | 989 |
| „ x B.6450 | Semi-Proven Cross. <i>S. officinarum</i> . | 774 | 633 | 529 |
| „ x Burke | „ | 103 | 0 | 0 |
| „ x B. 6835 | „ | 2,093 | 1,160 | 912 |
| „ x B. 693 | „ | 571 | 506 | 400 |
| „ x Q. 813 | „ | 365 | 337 | 280 |
| „ x D. 625 | „ | 9 | 0 | 0 |
| Bourbon x B.H.10(12) | „ | 674 | 550 | 450 |
| B. 3013 x B. 2935 | „ | 917 | 872 | 710 |
| B. 3138 x B. 2935 | „ | 85 | 74 | 40 |
| | | 37,922 | 13,460 | 9,623 |
| | Experimental Crosses Nobilisations. (a) <i>S. spontaneum</i> . (i) India 1st degree | | | |
| Ba.11569 x Dacca | 1st degree | 110 | 100 | 76 |
| B.3013 x B.35250 | 2nd „ | 190 | 180 | 160 |
| „ x B.35251 | 2nd „ | 699 | 180 | 150 |
| | | 999 | 460 | 386 |

APPENDIX I. (Contd.)

| Cross. | Group. | No. Germinations. (Nov.-Dec. 1936). | No. Potted (Jan.-Feb. 1937) | No. Planted in Field Nursery (Mar.-Apr. 1937) |
|-----------------------------|----------------------------|--|--------------------------------|--|
| Toledo x S.C.12/4 | (ii) Celebes 2nd degree | 167 | 150 | 125 |
| B. 35197 x B. 603 | 3rd degree | 30 | 27 | 25 |
| B. 35204 x B. 2935 | 3rd " | 762 | 170 | 160 |
| B. 35247 x B. 603 | 3rd " | 24 | 20 | 16 |
| | | 983 | 367 | 326 |
| Kassoer x B. 2935 | (iii) Java 2nd degree | 15 | 14 | 9 |
| B. 35257 x B. 2935 | 3rd " | 71 | 50 | 30 |
| B. 35261 x B. 2935 | 3rd " | 192 | 55 | 45 |
| B. 35263 x B. 2935 | 3rd " | 327 | 50 | 40 |
| B. 35267 x B. 2935 | 3rd " | 1 | 0 | 0 |
| B. 35268 x B. 2935 | 3rd " | 9 | 9 | 9 |
| P.O.J. 2725 x S. C. 12/4 .. | 4th " | 742 | 0 | 0 |
| B. 3013 x P.O.J. 2878 | 4th " | 1,225 | 493 | 370 |
| B. (36) L.6 x B.H.10(12) .. | 4th " | 1,594 | 200 | 150 |
| M.B. 148 x B. 2935 | 4th " | 202 | 180 | 130 |
| M.B. 96 x B.2935 | 4th " | 653 | 0 | 0 |
| MI. 20 x B. 6835 | 4th " | 424 | 120 | 112 |
| B.3274 x S. C. 12/4 | 4th " | 127 | 100 | 85 |
| B.3285 x B.H.10(12) | 4th " | 1,353 | 200 | 180 |
| B. 3286 x B. 2935 | 4th " | 55 | 0 | 0 |
| Ba.11569 x B.3384 | 4th " | 122 | 59 | 50 |
| B. 33101 x B. 2935 | 4th " | 273 | 50 | 45 |
| B.3172 x B. 2935 | 5th " | 1,822 | 160 | 142 |

APPENDIX I. (Contd.)

| Cross | Group | No. Germinations. (Nov-Dec., 1936) | No. Potted (Jan-Feb., 1937) | No. Planted in Field Nursery (Mar-Apr. 1937.) |
|----------------------------|-------------------------------------|---------------------------------------|--------------------------------|--|
| B. 3215 x B.H.10(12) .. | 5th degree | 6,621 | 200 | 190 |
| B. 3238 x B. 2935 .. | " " | 1,161 | 100 | 80 |
| B. 3320 x B. 603 .. | " " | 60 | 55 | 40 |
| B. 3321 x B.H.10(12) .. | " " | 2,887 | 150 | 109 |
| Ba.11569 x B. 3334 .. | " " | 1,963 | 100 | 0 |
| B. 3335 x B.2935 .. | " " | 3,388 | 50 | 30 |
| B. 34102 x B. 2935 .. | " " | 4,890 | 50 | 45 |
| B. 34131 x B. 603 .. | " " | 56 | 55 | 40 |
| B. 35225 x B. 2935 .. | " " | 404 | 50 | 40 |
| Ba.11569 x B. 35224 .. | " " | 293 | 50 | 47 |
| Rock Hall x B. 35176 .. | " " | 9 | 7 | 5 |
| B. 35230 x B. 603 .. | 6th " | 10 | 8 | 7 |
| B. 35185 x B. 2935 .. | 6th " | 240 | 100 | 95 |
| | | 31,190 | 2,620 | 2,135 |
| Ba.11569 x P.O.J. 234 .. | (b) <i>S. barberi</i> 2nd degree | 28 | 26 | 18 |
| P.O.J.2379 x B.H.10(12) .. | " " | 18 | 0 | 0 |
| B. 35211 x .. | 3rd " | 275 | 209 | 160 |
| B. 3365 x B. 2935 .. | 3rd " | 580 | 160 | 162 |
| B.35206 x B. 603 .. | 4th " | 250 | 240 | 180 |
| B. 35214 x Ba.6032 .. | 4th " | 0 | 0 | 0 |
| | | 1,151 | 635 | 520 |

APPENDIX I. (Concluded.)

| Cross. | Group. | No. Germinations. (Nov.-Dec. 1936). | No. Potted (Jan.-Feb. 1937). | No. Planted in Field Nursery (Mar.-Apr. 1937). |
|------------------------------|-------------------------------------|--|---------------------------------|---|
| B. 35271 x B. 2935 | (c) <i>S. sinense</i> 2nd degree | 25 | 25 | 18 |
| B.. 35273 x B. 2935 | 2nd degree | 6 | 0 | 0 |
| Ba. 11569 x B. 35272 | 2nd degree | 6 | 6 | 4 |
| „ x B. 35276 | 2nd degree | 52 | 50 | 38 |
| | | 89 | 81 | 60 |
| | (d) mixed derivation. | | | |
| B. 3238 x B. 35253 | .. | 1,944 | 200 | 180 |
| B. 3321 x B. 35212 | .. | 84 | 76 | 65 |
| Hathooni x B.34110 | .. | 0 | 0 | 0 |
| P.O.J. 2725 x B. 35243 | .. | 4,687 | 260 | 190 |
| Co. 213 x B. 3317 | .. | 4 | 0 | 0 |
| B. 3013 x B. 35221 | .. | 218 | 200 | 160 |
| B. 35218 x S.C. 12/4 | .. | 157 | 100 | 90 |
| Ba. 11569 x Co. 290 | .. | 20 | 18 | 10 |
| B. 3124 x Co. 290 | .. | 0 | 0 | 0 |
| M.D. 47 x B. 34116 | .. | 243 | 200 | 160 |
| B. 3215 x B. 35164 | .. | 20 | 19 | 12 |
| Ba.11569 x B. 3364 | .. | 106 | 0 | 0 |
| „ x B.34160 | .. | 529 | 200 | 190 |
| P.O.J. 2725 x Co. 281 | .. | 499 | 200 | 166 |
| B. 3368 x B. 35236 | .. | 45 | 40 | 30 |
| B. 3368 x B. 35162 | .. | 2 | 0 | 0 |
| P.O.J. 2725 x B. 34107 | .. | 2,038 | 200 | 170 |
| | .. | 10,596 | 1,713 | 1,423 |
| GRAND TOTALS | .. | 82,930 | 19,336 | 14,473 |

APPENDIX II.

Sugar Cane First Year Seedlings—B 38' Series.

List of Crosses and their Numbers of Seedlings Planted in the Field Nursery (April, 1936) and the First Year Seedling Trial (October and November, 1936).

| Group. | Cross. | No. in Field Nursery | No. Planted in First Year Seedling Trial. |
|--|------------------------|----------------------|---|
| Proven Crosses (<i>Saccharum officinarum</i>) | Ba. 11569 x B.H.10(12) | 730 | 436 |
| | „ x S.C.12/4 .. | 850 | 491 |
| | „ x B.603 .. | 430 | 282 |
| | „ x B.8069 .. | 295 | 121 |
| | „ x B.417 .. | 1,160 | 528 |
| Semi-Proven Crosses (<i>S. officinarum</i>) | Ba. 11569 x E.K.28 .. | 500 | 268 |
| | „ x Q.813 .. | 240 | 128 |
| | „ x Burke .. | 280 | 181 |
| | „ x B.6835 .. | 1,260 | 508 |
| | „ x D.625 .. | 220 | 145 |
| | „ x B.694 .. | 380 | 320 |
| | „ x B.693 .. | 560 | 433 |
| | „ x Badila .. | 770 | 397 |
| | Bourbon x B.H.10(12) | 75 | 43 |
| | „ x B.2935 .. | 20 | 8 |
| | B.3013 x B.H.10(12) | 130 | 91 |
| | B.3138 x B.2935 .. | 170 | 129 |
| | | 8,070 | 4,509 |

APPENDIX II—(Contd.)

| Group | Cross. | No. in Field Nursery | No. Planted in First Year Seedling Trial. |
|--------------------------|----------------------------|----------------------|---|
| Experimental Crosses | | | |
| Nobilisations | | | |
| (a) <i>S. spontaneum</i> | | | |
| (i) Celebes | | | |
| 3rd degree | B. 3352 x B.H.10(12) | 30 | 24 |
| | | 30 | 24 |
| (ii) Java | | | |
| 2nd degree | Synthetic Kassoer x B.2935 | 140 | 142 |
| 2nd degree | Kassoer x B.6835 | 230 | 70 |
| 3rd | P.O.J.2364 x B.2935 | 140 | 100 |
| " " | " x B.H.10(12) | 30 | 20 |
| " " | " x S.C.12/4 | 80 | 60 |
| " x 4th degree | B.3215 x P.O.J.2878 | 50 | 40 |
| 4th degree | B.(30)L6 x B.H.10(12) | 250 | 160 |
| " " | B.3353 x B.H.10(12) | 65 | 50 |
| " " | ME.72 x B.2935 | 38 | 30 |
| " " | MD.47 x S.C.12/4 | 50 | 40 |
| " " | P.O.J.2725 x S.C.12/4 | 160 | 100 |
| " " | MI.20 x S.C.12/4 | 100 | 80 |
| " " | MB.96 x B.2935 | 150 | 100 |
| " " | MB.148 x B.2935 | 45 | 33 |
| " " | B.3285 x B.H.10(12) | 80 | 60 |
| " " | B.3286 x B.H.10(12) | 120 | 90 |
| " " | B.3274 x S.C.12/4 | 140 | 90 |
| " " | B.3392 x B.603 | 50 | 40 |
| " " | B.3354 x B.H.10(12) | 50 | 40 |
| 5th | Ba.11569 x B.34161 | 110 | 90 |
| " " | " x B.3317 | 240 | 120 |

APPENDIX II.—(Contd.)

| Group. | Cross. | | No. in Field Nursery | No. Planted in First Year Seedling Trial. |
|-----------------------|---------------|--------------------------------|----------------------|---|
| 5th degree | B. 3215 | x B. H. 10 (12) | 670 | 350 |
| " " | B. 3335 | x B. 2935 | 65 | 50 |
| " " | B. 3368 | x B. 2935 | 120 | 90 |
| " " | B. 3238 | x B. 2935 | 125 | 100 |
| " " | B. 3013 | x B. 34130 | 250 | 160 |
| " " | B. 3013 | x B. 34134 | 67 | 50 |
| " " | B. 34101 | x B. 2935 | 37 | 30 |
| " " | B. 34102 | x B. 2935 | 260 | 160 |
| | | | 3,912 | 2,445 |
| (b) <i>S. barberi</i> | | | | |
| 1st degree | Ba. 11569 | x Dacca | 7 | 3 |
| 2nd degree | " | x P. O. J. 234 | 40 | 30 |
| 3rd degree | Co. 213 | x B. 391 | 10 | 10 |
| " " | B. 3365 | x B. 603 | 70 | 60 |
| | | | 127 | 103 |
| (c) <i>S. sinense</i> | | | | |
| 1st degree | Uba | x B. 603 | 10 | 3 |
| " " | " | x B. 6835 | 70 | 22 |
| | | | 80 | 25 |
| (d) Mixed Derivation | B. 3215 | x <i>S. Spont.</i> (Local Co.) | 500 | 150 |
| | Uba | x P. G. J. 2878 | 30 | 10 |
| | P. O. J. 2725 | x B. 3364 | 320 | 200 |
| | " | x B. 34107 | 490 | 200 |
| | Ba. 11569 | x B. 34116 | 120 | 80 |
| | Co. 213 | x P. O. J. 2878 | 7 | 7 |
| | " | x B. 3334 | 6 | 6 |

APPENDIX II.—(Concluded).

| Group. | Cross. | No. in Field Nursery | No. Planted in First Year Seedling Trial. |
|---------------------------------------|------------------------|----------------------|---|
| (d) Mixed Derivation .. Concluded. | MD.47 x Co.281 .. | 180 | 100 |
| | MD.47 x P.O.J.234 | 430 | 250 |
| | P.O.J.2725 x B.3358 .. | 280 | 150 |
| | P.O.J.213 x P.O.J.2878 | 55 | 40 |
| | Ba.11569 x Co.290 .. | 10 | 10 |
| | | 2,428 | 1,203 |
| GRAND TOTALS .. | | 14,647 | 8,309 |